CONTENTS

NUMBER 1/2

Special Issue: Deposition of Solids in Geothermal Systems

J. S. GUDMUNDSSON and D. M. THOMAS	1	Preface
J. BJÖRNSSON	3	Opening Address
D. M. THOMAS and J. S. GUDMUNDSSON	5	Advances in the study of solids deposition in geothermal systems
N. ANDRITSOS and A. J. KARABELAS	17	Laboratory studies of PbS scale formation in steel pipes
H. ÁRMANNSSON	25	Predicting calcite deposition in Krafla boreholes
S. ARNÓRSSON	33	Deposition of calcium carbonate minerals from geothermal waters—theoretical considerations
W. R. BENOIT	41	Carbonate scaling characteristics in Dixie Valley, Nevada geothermal wellbores
S. H. CHAN	49	A review on solubility and polymerization of silica
A. COUDRAIN-RIBSTEIN, A. VINSOT and P. IRIS	57	Space and time evolution of the geochemical processes arising from geothermal injection in an aquifer
H. R. CRECRAFT and B. A. KOENIG	65	Geochemical consequences of treated waste water injection at The Geysers, USA geothermal field
A. CRIAUD and C. FOUILLAC	73	Sulfide scaling in low enthalpy geothermal environments: a survey
E. DALAS and P. G. KOUTSOUKOS	83	Calcium carbonate scale formation on heated metal surfaces
P. J. FRYER	89	Modelling the behaviour of heat exchangers undergoing scaling
D. L. GALLUP	97	Iron silicate scale formation and inhibition at the Salton Sea geothermal field
S. R. GUDMUNDSSON and E. EINARSSON	105	Controlled silica precipitation in geothermal brine at the Reykjanes Geo-Chemicals plant

E. Gunnlaugsson and Á. Einarsson	113	Magnesium-silicate scaling in mixture of geothermal water and deaerated fresh water in a district heating system
J. L. Hernandez-Galan and A. Plauchu L.	121	Determination of fouling factors for shell-and-tube type heat exchangers exposed to Los Azufres geothermal fluids
Y. Hibara, M. Tahara and H. Sakanashi	129	Operating results and reinjection of Milos field in Greece
J. L. Honegger, I. Czernichowski-Lauriol, A. Criaud, A. Menjoz, S. Sainson and J. Guezennec	137	Detailed study of sulfide scaling at La Courneuve Nord, a geothermal exploitation of the Paris basin, France
R. Hurtado, S. Mercado and H. Gamiño	145	Brine treatment test for reinjection on Cerro Prieto geothermal field
R. Itoi, M. Fukuda, K. Jinno, K. Hirowatari, N. Shinohara and T. Tomita	153	Long-term experiments of waste water injection in the Otake geothermal field, Japan
P. W. Johnson	161	Fluid flashing and formation mineralization near producing geothermal wells: a literature review and simulation
A. J. Karabelas, N. Andritsos, A. Mouza, M. Mitrakas, F. Vrouzi and K. Christanis	169	Characteristics of scales from the Milos geothermal plant
G. Koutinas	175	High salinity fluid handling in Milos geothermal field
H. Kristmannsdóttir	183	Types of scaling occurring by geothermal utilization in Iceland
H. Kristmannsdóttir, M. Ólafsson and S. Thórhallsson	191	Magnesium silicate scaling in district heating systems in Iceland
R. Lesmo and C. Sommaruga	199	Deposition of solids from salt waters and brines in the Italian geothermal systems
B. Líndal	207	Solids deposition in view of geothermal applications in Reykjanes and Svartsengi, south western Iceland
B. Líndal and H. Kristmannsdóttir	217	The scaling properties of the effluent water from Kizildere power station, Turkey, and recommendation for a pilot plant in view of district heating applications

S. Mercado, F. Bermejo, R. Hurtado B. Terrazas and L. Hernández — 225 Scale incidence on production pipes of Cerro Prieto geothermal wells

A. E. Milodowski, D. Savage, K. Bateman and C. R. Hughes — 233 The precipitation of solids from potential heat exchange fluids for use in a HDR geothermal system in granite

M. Parlaktuna and E. Okandan — 241 The use of chemical inhibitors for prevention of calcium carbonate scaling

S. Pieri, F. Sabatelli and B. Tarquini — 249 Field testing results of downhole scale inhibitor injection

D. S. Pye, D. Holligan, C. J. Cron and W. W. Love — 259 The use of Beta-C titanium for downhole production casing in geothermal wells

M. J. Reed — 269 Thermodynamic calculations of calcium carbonate scaling in geothermal wells, Dixie Valley geothermal field, U.S.A.

C. A. Rochelle, A. E. Milodowski, D. Savage and M. Corella — 279 Secondary mineral growth in fractures in the Miravalles geothermal system, Costa Rica

H. Thordarson and Th. Tomasson — 287 Brine clarification at Svartsengi, Iceland: effect of pH and temperature on the precipitation of silica and its properties

A. H. Truesdell, J. R. Haizlip, H. Armannsson and F. D'Amore — 295 Origin and transport of chloride in superheated geothermal steam

L. Vaca, A. Alvarado and R. Corrales — 305 Calcite deposition at Miravalles geothermal field Costa Rica

F.-D. Vuataz, I. Czernichowski-Lauriol, C. Fouillac and S. Detoc — 313 Chemical study of a low temperature geothermal fluid in a Triassic sandstone aquifer: scaling potential and fluid treatment (Melleray, France)

T. Yokoyama, Y. Takahashi, C. Yamanaka and T. Tarutani — 321 Effect of aluminium on the polymerization of silicic acid in aqueous solution and the deposition of silica

B. P. K. Yung, H. Merry and T. R. Bott — 327 Effects of particle–surface interactions on deposition and re-entrainment of a particulate fouling system

D. M. Thomas and J. S. Gudmundsson — 337 Research directions in solids deposition in geothermal systems

343 List of Participants

Geothermal News & Views 349 3rd Meeting of the Organizational Working Group (OWG) for the *International Geothermal Association* (IGA)

353 Editor's Acknowledgements

355 New Patents

I Software Survey Section

NUMBER 3

J.-S. GUDMUNDSSON and H. THRÁINSSON 357 Power potential of two-phase geothermal wells

R. MCKIBBIN and K. PRUESS 367 Some effects of non-condensible gas in geothermal reservoirs with steam–water counterflow

J. J. GELEGENIS, V. A. LYGEROU and N. G. KOUMOUTSOS 377 A numerical method for the solution of geothermal reservoir model equations

N. D. MORTIMER and R. HARRISON 393 Comparison of U.K. geothermal and U.S. oil well costs

F. URBANI 403 Geothermal reconnaissance of northeastern Venezuela

A. G. REYES and C. M. CARDILE 429 Characterization of clay scales forming in Philippine geothermal wells

G. GIANELLI and G. SCANDIFFIO 447 The Latera geothermal system (Italy): chemical composition of the geothermal fluid and hypotheses on its origin

M. FYTIKAS, T. KAVOURIDIS, C. LEONIS and L. MARINI 465 Geochemical exploration of the three most significant geothermal areas of Lesbos Island, Greece

477 New Patents

NUMBER 4

Special Issue: Testing Geophysical Exploration Techniques on the Island of Milos (Greece)

E. STAROSTE and J. WOHLENBERG 481 Introduction: the background to the Milos geophysical project

M. Fytikas — 485 — Updating of the geological and geothermal research on Milos island

C. P. Thanassoulas — 497 — Application of the self potential technique over the Milos geothermal test site

C. Drews, N. Fürch, H. M. Maurer, G. Musmann and P. Weidelt — 507 — Active audiomagnetotellurics on Milos (Greece) for determination of electrical conductivity distribution and its correlation with geothermal anomalies

V. R. S. Hutton, D. Galanopoulos, G. J. K. Dawes and G. E. Pickup — 521 — A high resolution magnetotelluric survey of the Milos geothermal prospect

V. Haak, O. Ritter and P. Ritter — 533 — Mapping the geothermal anomaly on the island of Milos by magnetotellurics

A. Beauce, H. Fabriol, D. Le Masne and J. P. Decriaud — 547 — Test of an integrated methodology for high enthalpy exploration on the island of Milos (Greece)

N. Ochmann, D. Hollnack and J. Wohlenberg — 563 — Seismological exploration of the Milos geothermal reservoir, Greece

A. Hirn, M. Sachpazi and A. Nercessian — 579 — Elements for a model of the geothermal field of Milos from seismological data

D. C. Booth, S. Schleper, S. Crampin, N. Ochmann and J. Wohlenberg — 597 — Shear-wave splitting observations on Milos, Greece

M. Fytikas, J. D. Garnish, V. R. S. Hutton, E. Staroste and J. Wohlenberg — 611 — An integrated model for the geothermal field of Milos from geophysical experiments

Geothermal News & Views — 623

NUMBER 5/6

C. O. Grigsby, J. W. Tester, P. E. Trujillo, Jr and D. A. Counce — 629 — Rock–water interactions in the Fenton Hill, New Mexico, hot dry rock geothermal systems. I. Fluid mixing and chemical geothermometry

C. O. Grigsby and J. W. Tester — 657 — Rock–water interactions in the Fenton Hill, New Mexico, hot dry rock geothermal systems. II. Modeling geochemical behavior

R. M. Prol-Ledesma and P. R. L. Browne — 677 — Hydrothermal alteration and fluid inclusion geothermometry of Los Humeros geothermal field, Mexico

D. ELSWORTH and J. XIANG — 691 — A reduced degree of freedom model for thermal permeability enhancement in blocky rock

A. CRIAUD, C. FOUILLAC and B. MARTY — 711 — Low enthalpy geothermal fluids from the Paris basin. 2—Oxidation-reduction state and consequences for the prediction of corrosion and sulfide scaling

G. MICHARD, D. GRIMAUD, F. D'AMORE and R. FANCELLI — 729 — Influence of mobile ion concentrations on the chemical composition of geothermal waters in granitic areas. Example of hot springs from Piemonte (Italy)

R. G. ALLIS and Y. YUSA — 743 — Fluid flow processes in the Beppu geothermal system, Japan

D. ELSWORTH — 761 — Thermal recovery from a multiple stimulated HDR reservoir

D. DEMING — 775 — Application of bottom-hole temperature corrections in geothermal studies

Book Review
L. RYBACH — 787 — Bibliography on Heat and Mass Transfer in Porous Media. Compiled by CHRISTOPH CLAUSER and JÖRN BEHRENS

Geothermal News & Views

789 — 11th New Zealand Geothermal Workshop

789 — Atlas of Geothermal Resources

790 — 4th Meeting of the Organisational Working Group (OWG) for the *International Geothermal Association* (IGA)

797 — New Patents

799 — Editor's Acknowledgements

801 — Corrigenda

I — Software Survey Section

(i) — Volume Contents and Author Index, Volume 18, 1989